

**ABSTRACT OF THE DISCLOSURE**

A gamma camera includes a number of bar detector strips made of scintillating material, arranged in a stack configuration, where at least one photodetector is coupled to one or both ends of each detector strip, and a slat collimator including a plurality of elongated slats, for collimating each of the bar detector strips to receive gamma photons in only a single dimension. According to another aspect of the invention, a method of obtaining tomographic images of an object includes the steps of obtaining a number of sets of planar integral scintillation event data from the object at a number of azimuth angles of a rotating scintillation detector for each of a number of gantry angles of a gamma camera, and reconstructing the sets of planar integral scintillation event data to form a tomographic image of the object.